

HAIR STYLING DEVICE HAVING SHIELDED SPRING

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 The present invention relates to a hair styling device, and more particularly to a hair styling device having a suitably shielded spring member for preventing the spring member from being exposed and from hurting people.

2. Description of the Prior Art

10 Various kinds of typical hair styling devices have been developed and comprise a spring member engaged between two clasp plates, for biasing comb teeth of the clasp plates toward each other.

For example, U.S. Patent No. 5,988,184 to Shu discloses one of the typical hair styling devices comprising a spring member
15 having two legs engaged with two clasp plates respectively. Normally, the spring member is a coil spring having two legs extended toward different directions for engaging onto the clasp plates respectively.

In order to force or to bias the comb teeth of the clasp plates
20 toward each other, the spring member should be made shorter and should be made stronger in order to provide a suitable resilience to bias against the clasp plates. However, when the spring members are made stronger, the hair styling devices will be more difficult to be assembled. In addition, the spring members are exposed and may
25 clamp or hurt people inadvertently.

U.S. Patent No. 5,979,467 to Potut et al., and U.S. Patent No. 6,408,859 to Shyu disclose the other typical hair styling devices

also comprising a spring member having two legs engaged with two clasp plates respectively, and the spring member is suitably enclosed or shielded with blocks or lugs. However, the spring members are also made shorter and stronger to clamp and force the
5 clasp plates toward each other, such that it will also be more difficult to have the hair styling devices be assembled.

The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional hair styling devices.

10 SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a hair styling device including a suitably shielded spring member for preventing the spring member from being exposed and from hurting people.

15 The other objective of the present invention is to provide a hair styling device including a structure for allowing the spring member to be suitably and easily assembled into the clasp plates of the hair styling device.

The further objective of the present invention is to provide a
20 hair styling device including a pair of clasp plates that may be moved laterally relative to each other, for allowing the comb teeth to be moved away from each other when the clasp plates are opened relative to each other, and for allowing the comb teeth to be moved toward each other to clamp hair in place when the clasp plates are
25 forced and closed toward each other by the spring member.

In accordance with one aspect of the invention, there is provided a hair styling device comprising two clasp plates each

including a barrel provided thereon, and a spring member received and shielded within the barrels of the clasp plates, and including two ends coupled to the barrels of the clasp plates respectively, to recover and bias the clasp plates toward each other when the clasp
5 plates are released. The spring member may be suitably received and shielded and protected within the barrels.

Each of the barrels includes a positioning pin attached thereto, the ends of the spring member are coupled to the positioning pins of the barrels respectively.

10 Each of the barrels includes at least one groove formed therein to receive the positioning pin, and to secure the positioning pins to the barrels respectively, and thus to secure the ends of the spring member to the barrels respectively, and thus to allow the spring member to be twisted when the barrels are rotated relative to each
15 other.

Each of the positioning pins includes a curved arm formed therein to define a curved depression therein, and to stably receive the ends of the spring member respectively. The spring member includes two hooks provided on the ends thereof respectively, for
20 coupling to the positioning pins of the barrels respectively.

Each of the clasp plates includes a cavity formed therein, each of the barrels includes a protrusion extended therefrom and engaged into the cavities of the clasp plates respectively, to secure the barrels to the clasp plates respectively.

25 Each of the barrels includes an inclined surface formed therein, the inclined surfaces of the barrels are slidably engaged with each other to move the barrels toward each other and away from each

other when the barrels and the clasp plates are rotated relative to each other.

Each of the clasp plates includes a plurality comb teeth provided thereon, the comb teeth of the clasp plates are movable
5 toward and away from each other when the barrels are moved toward and away from each other by a sliding engagement between the inclined surfaces of the barrels.

A shaft may further be provided and received in the barrels, the shaft including an orifice formed therein to receive and shield the
10 spring member.

Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

15 **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is an exploded view of a hair styling device in accordance with the present invention;

FIG. 2 is a perspective view of the hair styling device;

FIG. 3 is a side schematic view of the hair styling device;

20 FIG. 4 is a partial top plan schematic view of the hair styling device;

FIG. 5 is a partial cross sectional view of the hair styling device, taken along lines 5-5 of FIG. 2; and

FIG. 6 is an exploded view similar to FIG. 1, illustrating the
25 other arrangement of the hair styling device.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and initially to FIGS. 1-5, a hair

styling device in accordance with the present invention comprises a pair of clasp plates 10, 30 each including a barrel 20, 40 provided or attached to the middle portion thereof, one or more comb teeth 12, 32 formed or provided on one end or the lower portion thereof, and
5 a handle 13, 33 provided or formed on the other end or the upper portion thereof for moving the comb teeth 12, 32 of the clasp plates 10, 30 away from each other.

For example, each of the clasp plates 10, 30 includes a cavity 11, 31 formed in the middle portion thereof, and each of the barrels
10 20, 40 includes a protrusion 21, 41 extended therefrom, and engaged into the corresponding cavities 11, 31 of the clasp plates 10, 30, for allowing the barrels 20, 40 to be solidly secured to the clasp plates 10, 30 respectively, with such as force-fitted engagements, adhesive materials, fasteners or latches (not shown), or by welding processes.

15 Alternatively, as shown in FIG. 6, the protrusion 21, 41 of the barrels 20, 40 may also be formed integral with the clasp plates 10, 30 while forming the clasp plates 10, 30 and the barrels 20, 40 with such as molding or mold injection processes, for allowing the barrels 20, 40 to be solidly secured to the clasp plates 10, 30
20 respectively.

Each of the barrels 20, 40 includes a bore 22, 42 formed therein for rotatably receiving a shaft 50 therein, and includes one or more grooves 23, 43 formed in the outer end thereof for receiving a positioning pin 60, 61 therein, and includes an inclined surface 24,
25 44 formed in the inner end thereof, and arranged for allowing the inclined surfaces 24, 44 of the barrels 20, 40 to be slidably engaged with each other (FIGS. 4, 5). The clasp plates 10, 30 may thus be

rotatably secured together with the barrels 20, 40 and the shaft 50.

Each of the positioning pins 60, 61 includes one or two ends engaged in the grooves 23, 43 of the barrels 20, 40 respectively, by such as force-fitted engagements, adhesive materials, or by welding processes, and includes a curved arm 62 formed or provided in the middle portion thereof, to form or define a curved depression 63 therein. The positioning pins 60, 61 may also be formed integral with the barrels 20, 40 while forming the barrels 20, 40 with such as molding or mold injection processes.

A spring member 70 is received and shielded within the through orifice 51 of the shaft 50, and includes two hooks 71, 73 formed or provided on the ends thereof, for engaging with or for attaching or coupling to the barrels 20, 40 with the curved arms 62 of the positioning pins 60, 61, in order to force or bias the barrels 20, 40 of the clasp plates 10, 30 toward each other. The hooks 71, 73 of the spring member 70 may be safely and stably received within the curved depression 63 of the positioning pins 60, 61 respectively.

In operation, as shown in FIG. 4, when the handles 13, 33 are depressed and forced toward each other by the users, in order to move or disengage the comb teeth 12, 32 of the clasp plates 10, 30 away from each other, the barrels 20, 40 and thus the positioning pins 60, 61 may also be forced to be rotated in different directions relative to each other.

For example, the barrel 20 may be rotated counterclockwise as shown in dotted lines in FIG. 3, and the positioning pin 60 may be moved leftwardly as seen from FIG. 4, and the other barrel 40 may be rotated clockwise, and the other positioning pin 61 may be

moved rightwardly as seen from FIG. 4, such that the spring member 70 may be twisted and the spring member 70 may thus generate or apply a spring biasing force against the barrels 20, 40 and the clasp plates 10, 30.

5 When the handles 13, 33 of the clasp plates 10, 30 are released by the users, the spring biasing force of the spring member 70 may bias and recover the barrels 20, 40 and the clasp plates 10, 30 back to the original position where the comb teeth 12, 32 of the clasp
10 plates 10, 30 may be forced toward each other and may be engaged with each other for clamping the hair of the users between the comb teeth 12, 32 of the clasp plates 10, 30.

 In addition, the inclined surfaces 24, 44 of the barrels 20, 40 may be slidably engaged with each other to control the barrels 20, 40 to move toward each other (FIGS. 2, 5), or to move away from
15 each other (FIG. 4), when the barrels 20, 40 and the clasp plates 10, 30 are rotated relative to each other by the users. When the barrels 20, 40 are moved away from each other, as shown in FIG. 4, the spring member 70 may be pulled or stretched, and the spring
20 member 70 may thus further generate or apply a spring biasing force against the barrels 20, 40 to bias or force the barrels 20, 40 toward each other.

 When the barrels 20, 40 are moved away from each other by the sliding engagement between the inclined surfaces 24, 44 of the barrels 20, 40, the clasp plates may also be moved laterally relative
25 to each other, for allowing the comb teeth 12, 32 to be moved away from each other and to be easily engaged into the hair of the users when the clasp plates 10, 30 are opened relative to each other, and

for allowing the comb teeth 12, 32 to be moved toward each other to clamp hair in place when the clasp plates 10, 30 are forced and closed toward each other by the spring member 70.

It is to be noted that the spring member 70 may be suitably received and shielded and protected within the shaft 50. However, the spring member 70 may also be suitably received and shielded and protected within the barrels 20, 40 of the clasp plates 10, 30 without the shaft 50. None of the typical hair styling devices includes a spring member that may be received and shielded with barrels of two clasp plates. The barrels 20, 40 and the clasp plates 10, 30 may be biased and recovered back to the original position simply by the twisting of the spring member 70 that has two end hooks 71, 73 secured or positioned or anchored to the barrels 20, 40 respectively with the positioning pins 60, 61 respectively.

Alternatively, the barrels 20, 40 and the clasp plates 10, 30 may also be biased and recovered back to the original position simply by the sliding engagement between the inclined surfaces 24, 44 of the barrels 20, 40, and the spring biasing force of the spring member 70 that is not required to have the two end thereof secured or positioned or anchored to the barrels 20, 40 respectively.

It is further to be noted that the spring member 70 includes a longer length as compared with those of the typical hair styling devices, such that the spring member 70 may be easily pulled or stretched to easily engage the hooks 71, 73 onto the curved depression 63 of the positioning pins 60, 61 respectively, such that the spring member 70 may be easily engaged or assembled into the barrels 20, 40 of the clasp plates 10, 30 respectively.

Accordingly, the hair styling device in accordance with the present invention includes a suitably shielded spring member for preventing the spring member from being exposed and from hurting people, and includes a structure for allowing the spring member to
5 be suitably and easily assembled into the clasp plates of the hair styling device, and includes a pair of clasp plates that may be moved laterally relative to each other, for allowing the comb teeth to be moved away from each other when the clasp plates are opened relative to each other, and for allowing the comb teeth to be moved
10 toward each other to clamp hair in place when the clasp plates are forced and closed toward each other by the spring member.

Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that
15 numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.